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## SOLDIER HEALTH TRACKING SYSTEM USING ARDUINO

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### ABSTRACT

Today, the battlefield is an essential element of any national security. One of the main roles played by an army soldier. Various measures were taken to protect the soldiers. Therefore, for their safety, they can use many instruments to observe their health. Bioprobe systems include different types of biosensors, delivery systems, and processing capabilities, facilitating low-cost, non-invasive wearable health monitoring solutions. GPS is used to find the longitude and latitude so that location of the soldier can be easily known. These devices are attached to weapons and clothing, and some armies like the Israeli army are exploring the possibility of integrating GPS devices into soldiers jackets and uniforms so that base stations can monitor their soldiers in real time scenarios.

**Keywords:** Heartbeat Sensor, Temperature sensor, GPS

### 1. INTRODUCTION:

The main job is to maintain soldier parameters such as temperature, respiration and heart rate. The design of Arduino Uno for the soldier monitoring system can be interpreted as a system for monitoring physiological information, including heart rate, body temperature, gas-related parameters and other parameters. Based on the prototype model, we monitor body parameters, heart rate and temperature via Arduino Uno. The best soldier orientation and related medical information can be sent to base stations in real time so that each base station can take necessary action. Internet of Things (IoT) with Global Positioning System (GPS) is used to track a soldier's location and monitor health conditions such as heart rate and body temperature.

1. In unstable physiological regulation systems, for example, in the event of a gas overdose
2. In life-threatening situations, for example, a soldier has a heart attack.

3. In cases resulting in the development of a dangerous life-threatening situation.
4. In critical physiological condition.
5. Locate the exact position of the soldier.

### 2. LITERATURE REVIEW:

In 2018 Niket Patil et al., [1] proposed a health monitoring and tracking system. This article presents an IoT-based soldier health monitoring and tracking system. The proposed module could be attached to soldiers to find their health conditions and current location using GPS. This data will be sent to the base station via the IoT. The modules provided allow the execution of courses at low cost to protect the precious lives of soldiers on the battlefield.

William Walker AL et al., [2] in 2018 presented Mobile Health Monitoring. The authors discuss different wearable and portable small weight and size sensors that have been developed to observe the health of soldiers.

The BSN contains sensors such as heart rate and temperature sensors that can be placed on soldiers for real-time health monitoring. This article presents a method for developing a real-time health monitoring system for soldiers composed of interconnected BSNs.

Akshay Gondalic et al., [3] Designing an IoT-Based Healthcare Monitoring System for soldiers by Using Machine Learning in 2018.

Jasvinder Singh et al [4] in 2019 proposed a global positioning system (GPS) and an Internet of Things (IoT) based soldier health positioning and reporting system. Uninterrupted communication is possible. Soldiers can communicate from anywhere, which can help soldiers communicate with other soldiers when needed. The circuit is simple, the power consumption is low, and the total power consumption of the module is reduced by using low-power peripherals and an ARM processor. The devices used are smaller and lighter, so they can be carried safely by soldiers.

The GPS location of soldiers all over the world is also monitored by the health system, so the vital

health parameters of soldiers ensure the safety of soldiers.

The system allows military base stations to track locations and monitor soldiers' medical conditions using GPS, temperature sensors, heart rate sensors, and more. Sensor information and GPS values will be transmitted wirelessly to other soldiers via a ZigBee system. Additionally, the LoRaWAN network system is offered for use between base station masters and theaters that lack cellular network coverage or do not allow data transmission. The collected information will be uploaded to the cloud for data analysis and prediction using the K-means clustering algorithm in the next step.

Afef Mdhaftar et al. , [5] demonstrated IoT-based health monitoring work via LoRaWAN in 2017, where collected biosensor data was sent via low-cost, low-power data communication. Use the analytics module web framework to ensure security. The measures heart rate, body temperature and blood glucose in rural areas where cellular network coverage does not allow data transmission or does not exist.

When the LoRaWAN Gateway is placed outdoors at a height of 12 meters, the average LoRaWAN coverage area is approximately 33 square kilometers. The monitoring module is supposed to consume ten times less power than other long range cellular solutions such as GPRS/3G/4G.

### 3. PROPOSED SYSTEM:

A block illustration representation of the system factors is shown in Figure 1.

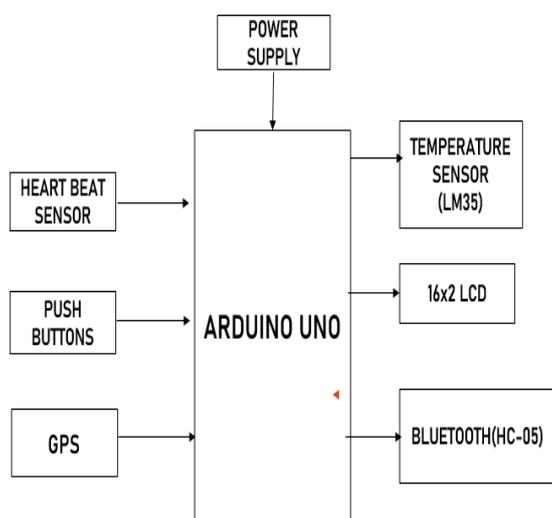


Fig.1 Block diagram

This composition is about the Soldier Health Monitoring System. Block illustration of dogface position shadowing and health monitoring system using IoT includes heart rate and temperature detectors, power force and GPS as Arduino UNO input as processing device. Figure 1 Block illustration of the proposed system. Arduino Uno for streamlining information to the pall. Buzzer, TV display, communication transferring as affair bias. The system improves the safety of exigency response during military operations. Heart Rate Sensor A detector that measures blood inflow at the fingertip, giving heart

rate by blood volume over time. A temperature detector is a detector that measures the heat it detects and gives the temperature in degrees Celsius. GPS is used to find the exact position of dogfaces. A dogface's direction can be set up using a GPS modem. The GPS modem receives the signal from the satellite and calculates the longitude and latitude of the dogface's exposure and sends the periodical data to the regulator.

Arduino UNO is an open source microcontroller board grounded on the Microchip AT mega 328P microcontroller, developed by Arduino. Arduino UNO checks heart rate and temperature status. However, the Arduino will turn on the buzzer, If the heart rate is above or below its threshold. position information, heart rate, temperature, and gas discovery are transferred to the MCU knot via periodical communication. When Wi- Fi is available, it receives and reads data from the periodical harborage of Arduino and uploads the data to IoT and compares the data, if there's a difference in the threshold, it sends SMS/ e- matters to the army base station.

### 4. RESULTS:

The results are shown in Figure 1 and Figure 2. A message/e-mail is sent to the intended recipient confirming the GPS geographic information. When the normal body parameters differ from the thresholds, an alert message/email is sent to the base station with the exact location of the soldier. The following results can be obtained from the execution above. It can collect and process important body parameters and position information of soldiers. When the ambient temperature rises above or equal to a threshold of 30 degrees, the chiller will turn on. When the temperature is below a threshold (less than or equal to 22 degrees), the heating comes on. When the pulse is higher or lower than normal, the system sends an email/message to the base station with the soldier's location. When the gas value is above a threshold of 700 or more, the system will send an email/message to the base station with the soldier's location.

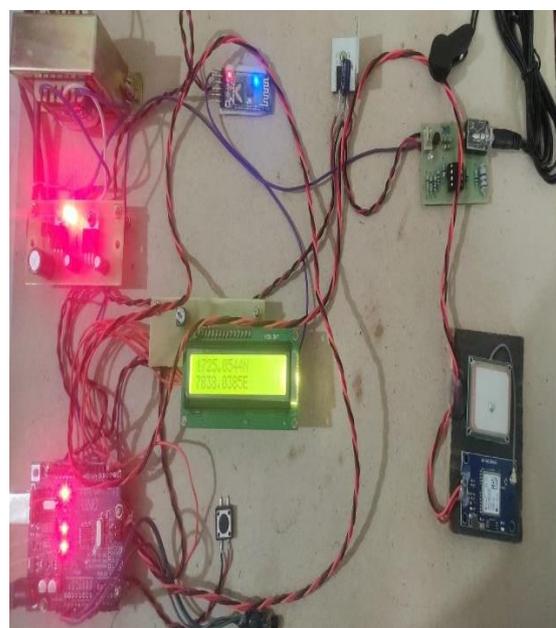


Fig.2 Output 1

**HC-05**

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HC-05: Location: 1725.0531N, 7838.0410E
HC-05:
HC-05: ALERT,ABNORMAL HEARTBEAT FOR THE
SOLDIER AT LOCATION: https://www.google.co.in
/maps/place/17.41755,78.63401
HC-05:
$PMTK314,0,1,0,1,0,0,0,0,0,0,0,0,0,0,0,0*28
HC-05: $PMTK220,1000*1F
HC-05: $PGCMD,33,1*6C
HC-05: $PMTK605*31
HC-05: Location: 1725.0522N, 7838.0429E
HC-05:
HC-05: ALERT,HIGH TEMPERATURE FOR THE
SOLDIER AT LOCATION: https://www.google.co.in
/maps/place/17.41754,78.63405
HC-05:
$PMTK314,0,1,0,1,0,0,0,0,0,0,0,0,0,0,0,0*28
HC-05: $PMTK220,1000*1F
HC-05: $PGCMD,33,1*6C
HC-05: $PMTK605*31
HC-05: Location: 1725.0522N, 7838.0424E
HC-05:
HC-05: ALERT,HIGH TEMPERATURE FOR THE
SOLDIER AT LOCATION: https://www.google.co.in
/maps/place/17.41754,78.63404
HC-05:
$PMTK314,0,1,0,1,0,0,0,0,0,0,0,0,0,0,0,0*28
HC-05: $PMTK220,1000*1F
HC-05: $PGCMD,33,1*6C
HC-05: $PMTK605*31
HC-05: Location: 1725.0523N, 7838.0419E
HC-05:
HC-05: ALERT,ABNORMAL HEARTBEAT FOR THE
SOLDIER AT LOCATION: https://www.google.co.in
/maps/place/17.41754,78.63404

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Fig.3 Output 2

**5. CONCLUSION:**

This project presents an IoT-based system for health monitoring and tracking of soldiers. Biomedical sensors deliver each soldier's heart rate, body temperature and environmental parameters to the control room. This technology can be useful in providing the exact location of a missing soldier in a critical condition and in overcoming the shortcomings of missing in action soldiers. The addressing system also helps improve soldier-to-soldier communication in an emergency and provides proper navigation to the control room. So we can conclude that this system will act as lifeguard for army personnel all over the world. In the future, a portable handheld sensor device with multiple sensing capabilities may be developed to assist soldiers. In addition, Grave gas sensors can be placed to measure the oxygen concentration in the environment. soldiers can be given medical briefing to overcome the situation, zigbee technology can be used to extend the range of communication network.

**6. FUTURE SCOPE:**

Soldier's being an important part of our nation's security, their health vitals and their position needs to be regularly covered for their safety and their effective working. Wireless communication with IOT makes the whole experience of covering dogfaces health vitals and their position, smart effective and fast. Technologies like IOT has unnaturally reformed the way we live and work, it has made our life easier. Above proposed system not only monitors real-time health and position data of the dogfaces but also provides necessary data to help us determine the last position and the health data of the dogfaces if he gets lost, so as to track him down and shoot help. This system increases the effectiveness of the dogfaces working in the field and also reduces the trouble of

hunt and deliverance operation led by control room unit at the same time. All by each, the system being compact and less in weight makes it more ideal for the dogface's and the squadron leaders to carry the system with them, which in turns helps the control unit knot to cover their data of in real-time, indeed if they're kilometers piecemeal.

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